

ADT 221A Multifunction Temperature Calibrator



OVERVIEW

A highly integrated Multifunction Temperature Calibrator featuring several patented technologies, the ADT221A is an ultra-compact, rugged, and ease-to-use hand-held device for sourcing, simulating and measuring temperature, and electrical signals. Its smartphone-like menu and interface make the operation simpler and easier. The ADT221A is ideal for calibrating, maintaining, and troubleshooting process instrumentations. Automation and documentation capabilities make the ADT 221A a turnkey solution.



- Sourcing, simulating and measuring temperature and electrical signals
- Smartphone-like menu and interface make the operation simpler and easier
- The internal cold junction compensation sensor can be re-calibrated at ice point by users
- Ultra-compact, 3.9" x 7.6" x 2.0", and 1.6 lb (0.7kg)

FEATURES

- **Sourcing, simulating and measuring temperature and electrical signals**
 - ✓ Sources and measures mV, mA, ohms, RTDs, thermocouples, frequency, and pulses
 - ✓ Simulates and measures 13 thermocouples and 11 RTDs to calibrate transmitters
 - ✓ 24V loop power supply
 - ✓ Simultaneous dual reading capability
 - ✓ Automatic switch test
 - ✓ Supports square root transmitter
 - ✓ Pulse frequency output for the calibration of flow totalizer
- **Easy to use**
 - ✓ Smartphone-like menu and interface make the operation simpler and easier
 - ✓ Ultra-compact, size 3.9" x 7.6" x 2.0" (100mm x 192mm x 52mm), and weight 1.6 lb (0.7 kg)
 - ✓ One hand operation
- **Calibrated cold junction compensation (Patented)**
 - ✓ Cold junction equivalent block in the calibrator
 - ✓ A calibrated PRT element with flexible leads is installed in the equivalent block for thermocouple cold junction compensation
 - ✓ This PRT element can be pulled out from the calibrator and re-calibrated and corrected at ice point by users
- **Built-in temperature readout**

CVD coefficients of a calibrated PRT can be input into the calibrator for accurate temperature measurement.
- **Multi lingual interface**

English, Chinese
- **Documenting and automated procedure capability**
 - ✓ Manage the information of the device under test.
 - ✓ Set up automated calibration procedures, and ADT 221A performs the test, calculates the errors, displays and/or stores the results in the memory, and highlights the out-of-tolerance points.
 - ✓ As-found and As-left functions allow recording and documenting results for quality control.
 - ✓ Download tasks and upload the results.
 - ✓ Snapshots allow you to capture and save work.
- **Build-in unit conversion tool**

Build-in converters for pressure units, temperature units, temperature vs. resistance (RTDs), and temperature vs. millivolt (thermocouples)
- **Display**

3.5 inch TFT color screen
- **Rugged**

Rugged design for harsh environments.
Passed a 1-meter drop test.
Three year warranty for the ADT 221A, and one year for the battery pack
- **Misuse protection**

Up to 30V voltage on any two sockets and up to 1A current on current sockets will not damage the calibrator. The calibrator will return to normal condition as soon as the voltage or current is removed.
- **Rechargeable battery**

Rechargeable Li-ion battery for 15 hours uninterrupted use. Battery life will be reduced when 24V is applied. The rechargeable battery is replaceable.

APPLICATIONS

The ADT221A multifunction temperature calibrator is a process tool for measuring, sourcing and simulating mA, mV, V, RTDs, thermocouples, ohms, frequency, and pulses, captures switch values and provides 24 V loop power.

Electrical

- Resistance measurement / simulation
- Voltage measurement / generation
- Current measurement / generation
- Frequency measurement / generation
- Pulse counting/generation
- 24 VDC loop supply
- Switch sensing

Temperature

- RTD measurement /simulation
- TC measurement /simulation

SPECIFICATIONS

Electrical Specifications

| Measurement Accuracy | | | |
|----------------------|---|------------|-------------------|
| | Range | Resolution | Accuracy |
| Voltage DC | ±75.0000 mV | 0.1µV | 0.01%RD+0.005%FS |
| | ±30.0000 V | 0.1 mV | 0.01%RD+0.005%FS |
| Current DC | ± 30.0000 mA | 0.1µA | 0.01%RD+0.005%FS |
| Resistance | Two-wire 0 to 400.000 Ω | 1mΩ | 0.02%RD+0.005%FS |
| | Three-wire 0 to 400.000 Ω | 1mΩ | 0.02%RD+0.005%FS |
| | Four-wire 0 to 400.000 Ω | 1mΩ | 0.01%RD+0.005%FS |
| | Two-wire 0 to 4000.00 Ω | 10mΩ | 0.02%RD+0.005%FS |
| | Three-wire 0 to 4000.00 Ω | 10mΩ | 0.02%RD+0.005%FS |
| | Four-wire 0 to 4000.00 Ω | 10mΩ | 0.01%RD+0.005%FS |
| Frequency | 1 to 50000.0 Hz | 0.1Hz | 0.005%RD+0.002%FS |
| Pulse | 0 to 999999 | 1 | N/A |
| Limit Switch | If the switch has defective voltage, its range is +3V to +24V | | |
| Source Accuracy | | | |
| Voltage DC | -10.000 to 75.000mV | 1µV | 0.02%RD+0.005%FS |
| | 0 to 12.0000 V | 0.1mV | 0.02%RD+0.005%FS |
| Current DC | 0 to 22.000 mA | 1µA | 0.02%RD+0.005%FS |
| Resistance | 1 to 400.00 Ω | 10mΩ | 0.02%RD+0.005%FS |
| | 1 to 4000.0 Ω | 100mΩ | 0.03%RD+0.01%FS |
| Frequency | 0 to 50000.0 Hz | 0.1Hz | 0.005%RD+0.002%FS |
| Pulse | 0 to 999999 | 1 | N/A |
| DC24V | N/A | N/A | 0.5V |

Temperature Specifications

| Thermocouple Measurement and Source Accuracy | | | | |
|--|------------|------------------------|---------------|---------|
| Measure and Simulate | Standard | Temperature Range (°C) | Accuracy (°C) | |
| | | | Measure | Source |
| S | IEC 584 | -50 to 1768 | -50 to 400 | 1.0 1.1 |
| | | | 400 to 1000 | 0.6 0.6 |
| | | | 1000 to 1768 | 0.7 0.8 |
| R | IEC 584 | -50 to 1768 | -50 to 200 | 1.4 1.4 |
| | | | 200 to 500 | 0.6 0.6 |
| | | | 500 to 1768 | 0.6 0.7 |
| B | IEC 584 | 0 to 1820 | 50 to 450 | 3.8 3.8 |
| | | | 450 to 800 | 0.9 0.9 |
| | | | 800 to 1820 | 0.7 0.7 |
| K | IEC 584 | -270 to 1372 | -250 to -200 | 1.0 1.1 |
| | | | -200 to -100 | 0.4 0.5 |
| | | | -100 to 600 | 0.3 0.3 |
| | | | 600 to 1372 | 0.4 0.5 |
| | | | -250 to -200 | 1.5 1.6 |
| N | IEC 584 | -270 to 1300 | -200 to -100 | 0.5 0.6 |
| | | | -100 to 1300 | 0.4 0.5 |
| | | | -250 to -200 | 0.6 0.7 |
| E | IEC 584 | -270 to 1000 | -200 to -100 | 0.3 0.3 |
| | | | -100 to 0 | 0.2 0.2 |
| | | | 0 to 700 | 0.2 0.3 |
| | | | 700 to 1000 | 0.2 0.4 |
| | | | -210 to -100 | 0.3 0.3 |
| J | IEC 584 | -270 to 1200 | -100 to 1000 | 0.3 0.4 |
| | | | -250 to -200 | 0.8 0.9 |
| T | IEC 584 | -270 to 400 | -200 to 0 | 0.4 0.4 |
| | | | 0 to 400 | 0.2 0.2 |
| | | | 0 to 1000 | 0.5 0.5 |
| C | ASTM E988 | 0 to 2315 | 1000 to 1800 | 0.7 0.9 |
| | | | 1800 to 2315 | 1.0 1.4 |
| | | | 0 to 100 | 0.5 0.5 |
| D | ASTM E988 | 0 to 2320 | 100 to 1100 | 0.4 0.5 |
| | | | 1100 to 2000 | 0.6 0.9 |
| | | | 2000 to 2320 | 0.9 1.3 |
| G | ASTM E1751 | 0 to 2315 | 0 to 200 | 2.4 2.4 |
| | | | 200 to 400 | 0.5 0.5 |
| | | | 400 to 1400 | 0.4 0.5 |
| L | DIN43710 | -200 to 900 | 1400 to 2315 | 0.7 1.0 |
| | | | -200 to -100 | 0.2 0.3 |
| | | | -100 to 400 | 0.2 0.2 |
| U | DIN43710 | -200 to 600 | 400 to 900 | 0.2 0.3 |
| | | | -200 to 0 | 0.4 0.4 |
| | | | 0 to 600 | 0.2 0.3 |

General Specifications





| Environmental Specifications | |
|------------------------------|--|
| Operating Temperature | -10°C to 50°C |
| Storage Temperature | -20°C to 60°C |
| Humidity | <90%, non-condensing |
| Safety Specifications | |
| European Compliance | CE Mark |
| Mechanical Specifications | |
| Display | 3.5 inch TFT color screen |
| Electrical Connection | φ4mm sockets and flat mini-jack thermocouple socket |
| RS232 Interface | standard RS232-DB9 socket |
| Size | 3.9" x 7.6" x 2.0" (100mm x 192mm x 52mm) |
| Weight | 1.6 lb (0.7 kg) |
| Power Supply | Polymer Li-ion rechargeable battery, or 10V DC adaptor |
| Battery | Rechargeable Li-ion battery (included) |
| Battery Life | 15 hours uninterrupted use |
| Battery Charge | Battery life will be reduced when 24V is applied |
| Battery Charge | 110V/220V external power adapter (included) |

SPECIFICATIONS





| RTD Measurement and Source Accuracy | | | | | | |
|-------------------------------------|-----------|------------------------|-------------|-----------------|--------------|--------|
| Measure and Simulate | Standard | Temperature Range (°C) | | Accuracy (°C) | | |
| | | | | Measure (2W/3W) | Measure (4W) | Source |
| Pt10(385) | IEC 751 | -200 to 850 | -100 to 200 | 0.65 | 0.60 | 0.65 |
| | | | 200 to 600 | 0.82 | 0.72 | 0.82 |
| | | | 600 to 850 | 0.96 | 0.82 | 0.96 |
| PT100(385) | IEC 751 | -200 to 850 | -100 to 200 | 0.15 | 0.1 | 0.15 |
| | | | 200 to 600 | 0.26 | 0.16 | 0.26 |
| | | | 600 to 850 | 0.34 | 0.20 | 0.34 |
| Pt100(3916) | IEC 751 | -200 to 850 | -100 to 200 | 0.15 | 0.1 | 0.15 |
| | | | 200 to 600 | 0.26 | 0.16 | 0.26 |
| | | | 600 to 850 | 0.33 | 0.20 | 0.33 |
| Pt200(385) | IEC 751 | -200 to 850 | -100 to 200 | 0.37 | 0.32 | 0.69 |
| | | | 200 to 600 | 0.51 | 0.41 | 0.92 |
| | | | 600 to 850 | 0.61 | 0.48 | 1.08 |
| Pt500(385) | IEC 751 | -200 to 850 | -100 to 200 | 0.20 | 0.16 | 0.36 |
| | | | 200 to 600 | 0.32 | 0.22 | 0.54 |
| | | | 600 to 850 | 0.40 | 0.27 | 0.67 |
| Pt1000(385) | IEC 751 | -200 to 850 | -100 to 200 | 0.1 | 0.05 | 0.25 |
| | | | 200 to 600 | 0.2 | 0.10 | 0.42 |
| | | | 600 to 850 | 0.27 | 0.14 | 0.54 |
| Cu10(427) | IEC 751 | -100 to 260 | -100 to 260 | 0.61 | 0.56 | 0.61 |
| Cu50(385) | IEC 751 | -50 to 150 | -50 to 150 | 0.17 | 0.13 | 0.17 |
| Cu100(385) | IEC 751 | -50 to 150 | -50 to 150 | 0.12 | 0.09 | 0.12 |
| Ni120(672) | DIN 43760 | -100 to 260 | -100 to 260 | 0.07 | 0.05 | 0.07 |
| Ni100(618) | DIN 43760 | -100 to 260 | -100 to 260 | 0.08 | 0.06 | 0.08 |

ORDERING INFORMATION

- **Model Number**
ADT 221A

| Optional Accessories | | |
|----------------------|--|---|
| Model number | Description | Picture |
| 9050 | USB to RS232 (DB-9 Male) Adapter |  |
| 9080 | Cold Junction compensation kits (including TC plug, compensation cable, S,R,B,K,J,T,E,N) |  |
| 9712 | Spare chargeable Li-ion battery for multifunction calibrator |  |
| 9816 | 110V/220V external power adapter for multifunction calibrator |  |
| 9906 | Carrying case for multifunction calibrator | |
| 9510 | Additel/Cal Task management software for multifunction calibrator | |
| 9121-221A | NIST traceable calibration for ADT 221A series multi-function calibrators | |

Accessories (included)

| | | |
|----------------------------------|----------------|---|
| 110V/220V external power adapter | 1 pc |  |
| Chargeable Li-ion battery | 1 pc |  |
| Test leads | 3 sets (6 pcs) |  |
| short circuit cable | 1 sets (2 pcs) |  |